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The GUINEA PIG



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THE GUINEA PIG¹

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The guinea pig is a rodent belonging to the family Caviidae, hence the less common term "cavy." These animals are native to several countries scattered from Central America throughout South America. The species from which the domestic cavy (*Cavia porcellus*) is derived is found in the Andes Mountains in Peru.

The guinea pig had been domesticated by the Indians of Peru long before the Spanish conquerors arrived. Mummified guinea pigs found in graves at Ancon, Peru, indicate that this animal was domesticated at a very early period. Whether Indians outside of Peru domesticated the guinea pig is not definitely known. The natives used the guinea pig for food and in religious ceremonies.

Guinea pigs have a rather short stocky body, short incisor teeth, very complex molar teeth, uncleft upper lip, legs nearly equal in length, and no tail. There are four toes on the front feet, three on the rear. The guinea pigs kept by the natives of Peru show most of the color variations that are seen in the laboratory guinea pigs, namely, solid colors, including golden agouti, black, chocolate, red, and tan; mixed colors, such as agouti or black with red or tan; and these colors with white spotting. A few other colors have been developed by breeders who supply animals for the laboratories.

Fanciers recognize several types or varieties, based mainly on hair characteristics. There are the English or smooth short-haired type (fig. 1); the Abyssinian, with short hair arranged in several rosettes

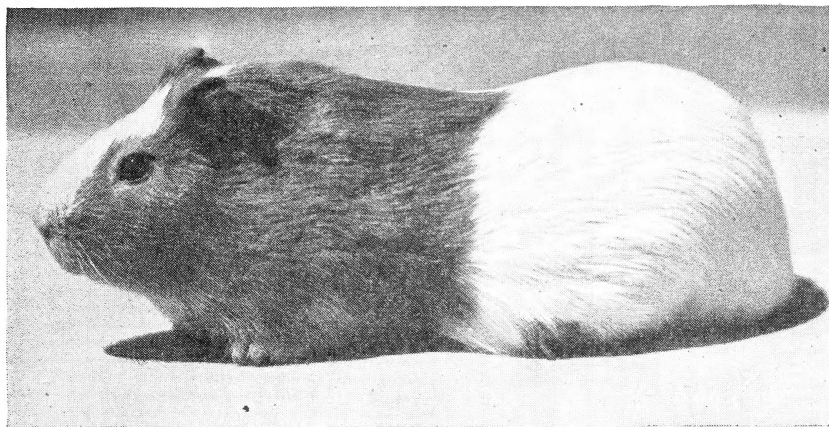


FIGURE 1.—Short-haired smooth guinea pig.

¹ Supersedes Farmers' Bulletin 525, Raising Guinea Pigs.

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scattered over the body and head (fig. 2); the Peruvian, with long fine silky hair spread over the head, face, and body (fig. 3); and the Peruvian Silky, having short hair on the head and face, but long hair on the body.

The different color patterns may be represented in all of these varieties. The recognized color patterns are: (1) A solid color known as self color. (2) Dutch marked, a dark color or any of the shades of

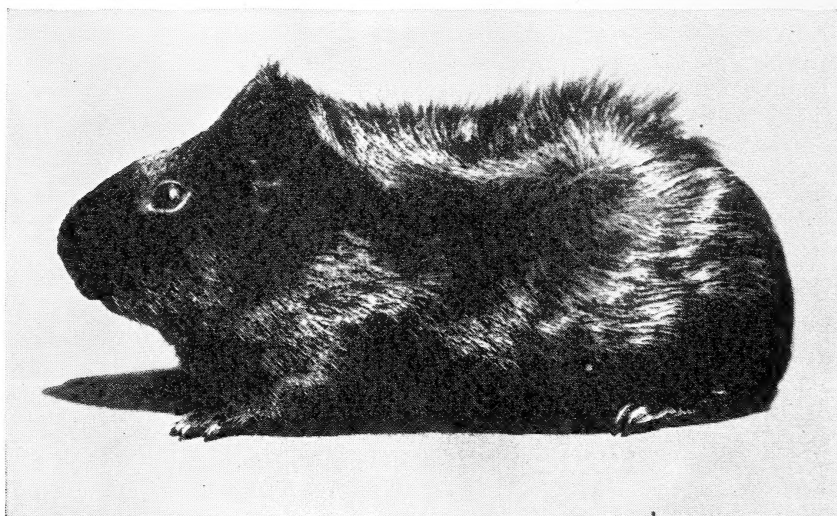


FIGURE 2.—Rough-haired black guinea pig.



FIGURE 3.—Long-haired albino guinea pig.

red or tan, with white. The separation between white and colored areas should be distinct, with no colored hairs appearing in the white areas. (3) The Himalayan, with white body and black nose, ears, and feet. (4) Tortoise-shell, with dark and tan spots more or less equal and well distributed over the body. The patches should be distinctly separated with no intermingling of the hairs of different colors. (5) Tortoise-and-white or tricolor, the tortoise-shell pattern in two pre-

dominating colors with distinctly marked areas of white. (6) Brindle, a mixture of dark and tan without distinctly outlined patches.

In its native habitat the guinea pig makes its nest in the tall grass and eats seeds, grass, and vegetables. In the homes of the natives in Peru the guinea pig shares the one-room house with the family and runs about freely, nesting in corners or under stone benches used by the natives for tables and seats. Table scraps and vegetables from the garden furnish food.

Uses

Just when guinea pigs were first used for scientific purposes is not known, but previous to 1870 the only use for guinea pigs in Europe and in the United States seems to have been as pets. Many guinea pigs were used in the period from 1870 to 1890, when Koch, Roux, Pasteur, and others were making their discoveries of the bacterial causes of disease and of agents for combating them. Since this period, the guinea pig has been used extensively for a wide variety of experimental purposes, including inoculation with pathogenic organisms for the purpose of studying the symptoms of a disease, the pathological changes involved, and the effects of certain drugs which may be used as curative agents; the standardization of vaccines, serums, and anti-toxins; genetic experiments; vitamin studies; observations on the estrous cycle of animals, now a regular clinical procedure; and many others. Many food-manufacturing companies maintain colonies of guinea pigs for standardizing the vitamin content of their products. Guinea pigs weighing 250 grams, or about one-half pound, are desired for many experimental purposes. They reach this weight at from 4 to 6 weeks of age.

The use of guinea pigs as food in the United States has not become popular, possibly because of prejudice regarding the use of rodents as food and the abundance of other food animals.

Many institutions using guinea pigs now maintain their own colonies or contract with people who raise large numbers which have been developed for specific tests. Many others are supplied through agencies which gather up smaller numbers of guinea pigs from numerous small producers. Anyone who contemplates raising guinea pigs should first arrange with a hospital, laboratory, or manufacturer of biological products or drugs, or with some agency which buys guinea pigs, for disposition of surplus stock. Guinea pigs are less in demand for vitamin C assay than formerly since it now can be determined directly by chemical analysis. The golden hamster may replace the guinea pig to a limited extent in some experimentation because of its greater prolificacy, shorter gestation period, and smaller size. On the other hand, the characteristic reactions of the guinea pig through a long period of observation make it more valuable than a comparatively new laboratory animal whose reactions have not been determined in many instances.

Care and Management

Guinea pigs do not thrive well in temperatures lower than 65° or 70° Fahrenheit. At temperatures lower than this they contract colds and respiratory diseases and the young often are born dead or die soon after birth. Drafts and too much moisture should be avoided.

Guinea pigs may be kept in pens about 30 by 36 inches and 12 to 15 inches high (fig. 4). A pen of this size will accommodate a male and 5 or 6 breeding females until the young are 3 or 4 weeks of age. A shelf about 4 inches off the floor is sometimes provided in a dark corner of the cage under which females with litters seek shelter and on which the animals like to sleep. Several pens may be stacked in tiers. The pen door should be of $\frac{1}{2}$ - or $\frac{3}{4}$ -inch mesh wire screen and it is advisable to have a screen near the top at the rear of the cage to afford ventilation. Larger pens about 5 by 10 feet will accommodate 30 to 50 animals. These also may be arranged in tiers, the upper tier being $3\frac{1}{2}$ to 4 feet above the lower, and the space between open. The sides of these pens should be 12 to 14 inches high and may be made of boards.

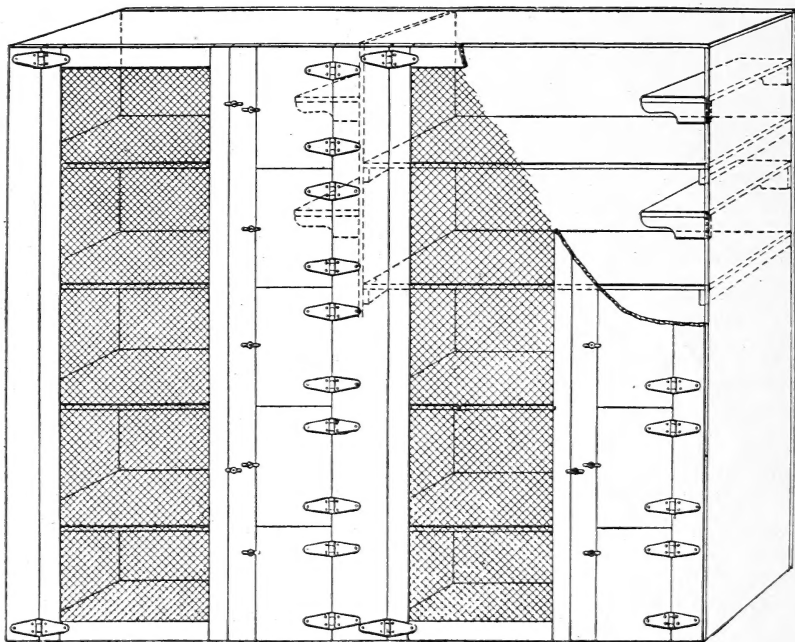


FIGURE 4.—Tiers of breeding pens suitable for five or six females and one male. Note shelves at upper right.

Guinea pigs are usually fed a grain ration consisting of whole or ground oats and wheat bran, or a ready-prepared ration such as is recommended for rabbits, consisting of a mixture of grains and minerals compressed into pellet form. Besides the grain ration, leafy alfalfa hay and fresh greens are necessary. The greens may be green cabbage, lettuce, kale, lawn clippings, green alfalfa, or similar plants. Greens are an absolute necessity to supply vitamin C, without which guinea pigs will develop scurvy. Fresh water should be supplied daily, though some breeders dispense with it when a plentiful supply of fresh succulent greens can be provided.

The floor of the pens should be covered with wood shavings or straw to absorb the moisture and be cleaned at least once a week. Feed

and water bowls and the pens should be sterilized and disinfected once or twice a year.

Reproduction and Growth

The female guinea pig becomes sexually mature in 30 to 45 days and will breed at this age. The male is not sexually mature until about 2 months of age. When the young guinea pigs are 40 to 50 days old the males should be placed in separate pens from the females.

The estrous cycle of the guinea pig varies from 14 to 17 days, averaging $15\frac{1}{2}$ days. Estrus lasts about 24 hours. The female comes into estrus immediately after giving birth to a litter and usually mates within 10 to 12 hours. Therefore the breeder male and females should be left together in the cage to insure regular mating. A vigorous female should produce four to five litters a year. The gestation period of the guinea pig varies from 65 to 70 days, the average being 68 days. The average number of young per litter is three, but sometimes there are as many as five or six and even more. The young are fully haired, with eyes open, and with teeth. They will start running around within an hour after birth. In 2 or 3 days' time they will start eating solid food and gain rapidly, reaching nearly half a pound by 30 days. The young should be left with the mother 3 to 4 weeks. Growth continues at a decreasing rate for about 18 months, when an adult weight of $13\frac{1}{4}$ to $21\frac{1}{2}$ pounds may be reached by males. The weight of the female varies, depending on whether she is pregnant and how far she is advanced in pregnancy. Unbred females are usually about 2 ounces lighter than males at 18 months of age. Guinea pigs will continue to produce young up to 5 years of age, but after 3 years there is more or less irregularity of breeding. Guinea pigs have been known to live past 7 years of age.

Diseases

Guinea pigs are susceptible to a variety of diseases. These may be classified according to their cause.

Bacterial Disease

Paratyphoid.—This disease is caused by *Salmonella typhimurium* or *S. enteritidis* and may be carried by rats or mice. Female guinea pigs may also act as carriers and serve as a continued source of infection to the colony. Infection usually takes place through the eating of contaminated food to which wild mice or rats have had access. Animals may die 48 to 72 hours after infection; others may live several weeks. Mortality rates may exceed 75 percent. In guinea-pig colonies the disease may make its appearance during the breeding season, and many animals will abort their young and die of purulent endometritis. There often is congestion of the viscera and enlargement of the liver, spleen, and mesenteric lymph nodes. If the disease is slow in its progress, the guinea pig will show pronounced loss of weight. The prevention and control of paratyphoid is difficult. Various sulfa drugs, particularly sulfamethazine, have been beneficial in treatment. Once a colony is infected, the most effective method of eradication is to destroy the animals, thoroughly disinfect the premises, and obtain new healthy stock. Making the building and feed room proof against the entrance of rats and mice will aid in prevention of the disease.

Pasteurellosis or hemorrhagic septicemia is caused by *Pasteurella aviseptica*. Contact with infected animals spreads this disease to healthy animals. It also may be air-borne or carried in the feed. Crowding and unsanitary conditions contribute to its spread. It is manifested by acute or chronic respiratory infection. In severe cases there is pneumonia, hemorrhagic and fibrous pleuritis, and pericarditis. The infection may also spread to the peritoneal cavity and uterus and cause enlargement of the spleen. Some animals seem to be more immune than others and should be selected for breeding stock.

Pseudotuberculosis is caused by *Pasteurella pseudotuberculosis*. Infection is through the intestinal tract. Affected guinea pigs lose weight, develop diarrhea, and die in 3 to 4 weeks. The lymph glands of the peritoneal cavity and inguinal regions are greatly enlarged, containing small abscesses filled with thick pus. The liver and spleen are enlarged and contain pale-grey nodules. Little is known regarding treatment for the disease except to dispose of an infected colony.

Sporadic tuberculosis may occur in guinea pigs, but under usual circumstances these animals have little chance of infection.

Pyogenic infections.—Abscesses of the subcutaneous tissue of the head, neck, or other parts of the body are sometimes caused by streptococci, staphylococci, and other organisms entering the tissues through small surface wounds. Often the cervical lymph glands are involved and the condition becomes epidemic. Affected animals should be destroyed to prevent contamination of the cages and other animals.

Pneumonia.—Epidemics of pneumonia caused by pneumococci sometimes occur in a guinea-pig colony. Mortality usually is high. Such outbreaks, however, are rare and are due to unusual circumstances. *Brucella bronchiseptica* also sometimes causes epidemics of pneumonia in guinea pigs.

Virus Diseases

Ascending paralysis may be caused by a virus of salivary-gland disease. The paralysis begins at the lower end of the spinal column and gradually works upward. The incidence of the disease is unknown.

Virus pneumonia is highly fatal in guinea pigs and may wipe out the whole colony. It is spread by contact. Remove all diseased animals to a separate room or dispose of them altogether.

Enterohepatitis is an acute disease of guinea pigs manifested by diarrhea and wasting. Its range of occurrence is unknown.

Salivary gland disease is an inapparent infection of guinea pigs. Inclusion bodies are present in hypertrophied cells of the ducts, salivary gland, and sometimes the kidneys.

Whenever an outbreak of disease occurs that involves a considerable portion of the colony, and death losses are high, an infectious ailment should be suspected. A laboratory diagnosis should be obtained if possible to determine the exact nature of the trouble, and the appropriate measures taken to control or preferably to eradicate the infection. Usually, prompt slaughter of all affected or exposed animals and complete burning or deep burial of the carcasses is the best procedure. This should be followed by thorough cleansing of cages and houses, burning of all litter, and disinfection of the entire premises. Several weeks should elapse before restocking.

Parasites

Lice are frequently troublesome to guinea pigs. The only effective treatment has been to dip all the animals in a solution of 1-percent creolin. This should be done in a heated room, and provision should be made for proper drying of the animals. Dipping in an emulsion or aqueous suspension containing 0.3 percent DDT (4 ounces of commercial 50-percent wettable DDT in 5 gallons of water) or in a preparation containing about 0.04 percent gamma benzene hexachloride (4 to 4.5 ounces of commercial wettable 50-percent BHC, containing 6 percent gamma insomer, in 5 gallons of water) is more effective than creolin and probably safer. Since all species of lice affecting domestic animals appear to be destroyed by these newer insecticides, it is probable that dusting sparingly with one or another of the commercial louse powders is an effective and safe alternative method of treatment.



